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# Intra-articular rheumatoid nodules and triggering of the knee joint

Z Tak-Diamant, F J J Hoening van Duyvenbode, F Eulderink, M Janssen

## Abstract

Rheumatoid nodules are a common extra-articular manifestation in rheumatoid arthritis. Intra-articular localisation of these nodules is rare and may produce clinical symptoms. Seven patients with walking problems due to an intra-articular rheumatoid nodule, which became entrapped on the ridge of the tibial plateau of the knee joint resulting in a phenomenon referred to as trigger knee, are described. After excision of the nodules all symptoms completely disappeared.

Rheumatoid nodules are characteristic extra-articular manifestations of rheumatoid arthritis. They are mainly found in the presence of rheumatoid factor<sup>1</sup> and may be indicative of more severe disease.<sup>2</sup> These nodules occur in 20-35% of patients with rheumatoid arthritis and they are commonly found subcutaneously over pressure points—for example, at the elbows, the buttocks, and the scalp.<sup>1</sup> They can also develop in several internal organs, such as the lungs, kidneys, and heart.<sup>3-4</sup> Intra-articular rheumatoid nodules, however, are rare.<sup>5-9</sup> In this retrospective study we considered seven patients with walking problems associated with intra-articular rheumatoid nodules of the knee joint.

## Patients and methods

From 1972 to 1989 six patients who visited our outpatient rheumatology clinic had seropositive rheumatoid arthritis and symptoms typical of intra-articular rheumatoid nodules of the knee joint. We also performed a computer search for patients who had had an operation for triggering of the knee joint caused by rheumatoid nodules and another patient was identified. We retrospectively studied the clinical features associated with the presence of intra-articular rheumatoid nodules in these seven patients.

Clinical data were collected from medical files. Preoperative radiographs of the affected knees were compared with those of the unaffected knees using the score system described by Larsen *et al.*<sup>10</sup> Operative data and post-operative course were reviewed.

The diagnosis of rheumatoid nodule was based on history and physical examination and was confirmed by histological examination of the excised lumps. Central fibrinoid necrosis surrounded by palisading histiocytic cells was considered diagnostic of rheumatoid nodules (figs 1 and 2).

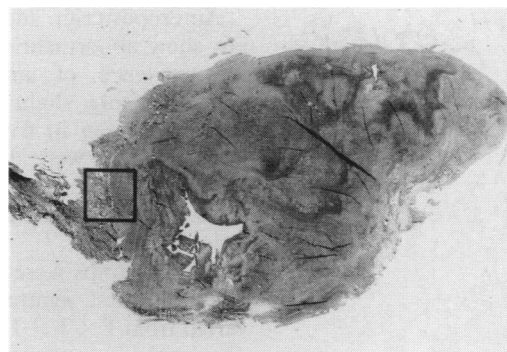


Figure 1 Rheumatoid nodule showing central fibrinoid necrosis. The boxed area is shown in detail in fig 2.

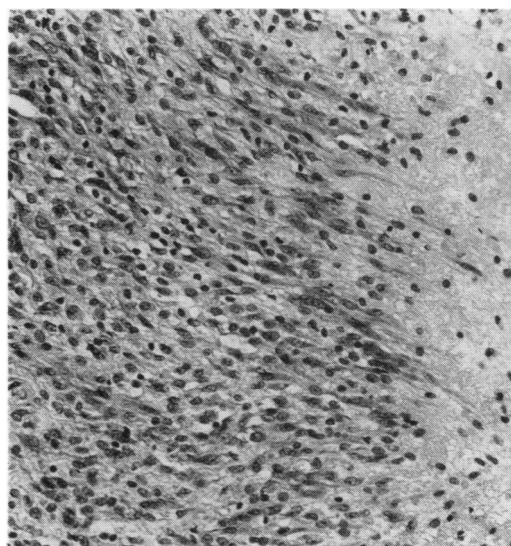


Figure 2 Detail of fig 1 showing typical palisades of histiocytic cells surrounding the necrotic centre.

## Results

Six women and one man were identified with symptoms during walking caused by intra-articular rheumatoid nodules. All patients had seropositive rheumatoid arthritis. The mean disease duration was 11.9 years (range 3-33 years, SD=10.7). The mean age of the patients was 53 years (range 39-69 years).

All patients had a history of recurrent pain accompanied by clicking, locking, and giving way of the affected knee joint. In three patients this triggering of the knee joint occasionally caused stumbling and falling. It was noted in one patient that in the presence of a gross joint effusion the triggering and pain disappeared. It recurred soon after removal of the synovial fluid, or after the administration of an intra-articular injection of corticosteroids.

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On physical examination a moderate synovitis with slight effusion was found in four patients and a firm lump was palpable in all seven. The lump appeared to be attached to the capsule. In six patients the lump was situated on the lateral side and in one patient on the medial side of the patella. On flexing the knee, the lump slipped over the underlying tibial plateau and hid behind the patella. Sometimes it was caught on the tibial plateau and caused triggering of the knee joint. This could be perceived as a palpable 'click'.

Anteroposterior and lateral radiographs did not show abnormalities that could account for the presence of intra-articular rheumatoid nodules. Only slight narrowing of the joint space was seen in five patients (Larsen score 0–1). Erosions were absent. In two patients the radiographs were normal. Affected and unaffected knees could not be distinguished radiologically.

All the lumps were excised within two years after the first symptoms. Their dimensions varied from  $1 \times 1 \times 1$  cm to  $3 \times 2.5 \times 1.5$  cm. The localisation appeared to be intracapsular—that is, within the fibrous capsule of the knee joint.

In six of the seven patients the diagnosis of rheumatoid nodule was confirmed by histological findings. In one patient insufficient material was obtained for histological examination. The synovium showed a mild inflammatory reaction in all patients.

The postoperative course was uneventful in all but one patient. In this patient haemarthrosis developed within two weeks during anticoagulant prophylaxis. In all patients triggering of the knee disappeared after removal of the rheumatoid nodules. Two patients had a symptomatic recurrence of the rheumatoid nodule within one and two years. Two to seven years after excision the others were still asymptomatic.

## Discussion

Walking problems are a common clinical symptom in patients with rheumatoid arthritis. Usually they are due to arthritis, instability of the lower limb joints, or loss of muscle strength. Rare causes of walking problems in rheumatoid arthritis include normal pressure hydrocephalus<sup>11</sup> and myelopathy.<sup>12</sup>

We report here intra-articular rheumatoid nodules of the knee joint as another cause of walking problems in patients with seropositive rheumatoid arthritis. Entrapment of an intra-articular rheumatoid nodule on the ridge of the tibial plateau has an easily recognisable clinical pattern consisting of clicking, locking, and giving way of the knee joint. This clinical pattern is comparable with trigger finger or trigger wrist.<sup>8</sup> Thus 'trigger knee' seems to be the most suitable name for this phenomenon. Chamberlain<sup>5</sup> reported another clinical feature of intra-articular rheumatoid nodules, namely the lack of full extension of the knee, resulting in walking problems. In three of our patients triggering of the knee joint resulted in stumbling

and falling. To our knowledge, such severe walking problems have not yet been reported in association with intra-articular rheumatoid nodules.

The differential diagnosis of triggering of the knee joint also includes intra-articular loose bodies, meniscal tears and cysts, ganglions, and patellar osteophytes.

In our patients the presumed diagnosis of intra-articular rheumatoid nodules of the knee joint was easily made solely by history and physical examination. Ultrasonography is possibly useful in distinguishing intra-articular rheumatoid nodules in several joints.<sup>13–16</sup> As a result of the localisation of the rheumatoid nodules within the fibrosis capsule, we conclude that arthroscopy will be superfluous in most patients with intra-articular rheumatoid nodules of the knee joint.

In our series of patients anteroposterior and lateral radiographs of the affected knees showed surprisingly little damage and had a similar Larsen score to those of the unaffected knees, as shown by other workers.<sup>5–7</sup>

In conclusion, intra-articular rheumatoid nodules can cause serious walking problems in patients with seropositive rheumatoid arthritis due to triggering of the knee joint, as a result of entrapment of the nodule on the ridge of the tibial plateau. This phenomenon is probably rare: only seven patients with trigger knee caused by intra-articular rheumatoid nodules were identified during 17 years in our rheumatology outpatient clinic. As most of the intra-articular rheumatoid nodules will probably remain symptomless, it is difficult to predict how often they really occur. In accordance with the other workers,<sup>5–7</sup> most of the nodules were located on the lateral side of the patella (86% of patients) and only one (14%) medially. The diagnosis can easily be made on the basis of the typical clinical manifestations and confirmed by histological examination. No additional investigations are required. Complete relief of the symptoms can be obtained by excision of the nodule.

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